

REMARKS

Claims 1, 2, 6-12 and 26-29 were rejected under 35 U.S.C. 102(b) on Tai, for reasons cited in the previous action. The Examiner stated that the polymer network of Tai may comprise pharmaceutical formulations and is water insoluble (hydrophobic). The major embodiment of Tai was seen as anhydrous i.e. an oil-phase composition. The composition of Tai was believed to be a polymer network which would require some entangling and entrapment of the hydrophobic polymer in the crosslinked polymer.

Applicant respectfully traverses the Examiner's rejection of claims 1, 2, 6-12 and 26-29 under '102(b) on Tai.

More particularly, Tai merely provides clusters of water-swellaable polymers by bringing together a first suspension of an aqueous solution of an α,β -unsaturated monomer in an inert hydrophobic liquid and a second suspension of water-swellaable polymer particles in an inert hydrophobic liquid. Through the process, the particles are brought together by the aqueous solution which renders the polymerized particles slightly sticky permitting agglomeration of the particles into clusters. The clusters are then separated from the hydrocarbon by filtration. Example 7 describes that the first suspension is prepared from an aqueous solution containing 4,313 g of water and 3,405 g of a 50% solution of sodium hydroxide.

Furthermore, Tai's Abstract, Summary, Description and Claims all require an aqueous solution to bond the polymer particles together. The bonding component in Tai is the residue of the aqueous solution incorporated into the polymer clusters. The resultant water-swellaable polymer clusters are useful in personal care products such as diapers where aqueous absorption is desired.

In contrast to Tai, in this invention, the polymeric system is an interpolymeric carrier concentrate (ICPN) for an active component, e.g. a sunblock, or other cosmetic or pharmaceutical formulation, which extends its water insolubility and resistance to rinse-off of the polymer. Accordingly, the interpolymeric concentrate herein is a highly stable, water resistant, anhydrous network whereas the prior art is intended to provide water-swellaable particles, so as to absorb aqueous fluids in use as a diaper.

The present ICPN products are produced under anhydrous conditions by sequential monomer polymerization. The active component is subsequently added to the ICPN carrier. If desired, the carrier in the oil suspension can be conveniently converted into emulsion by addition of water. However, as stated, no water is present during formation of the concentrate.

The product of the invention involves polymerizing and crosslinking A monomer derived from vinyl pyrrolidone and acrylic acid monomers followed by polymerization of monomer B, e.g. C₁-C₃₀ alkyl acrylate, in a second stage. Upon both polymerizations, the anhydrous ICPN concentrate product is obtained. Both A and B polymerizations are carried out under anhydrous conditions in a single reaction zone so that the B polymer will be formed and physically entrapped in the A polymer.

In view of the foregoing, reconsideration of the rejection of the rejection of claims 1, 6-12 and 26-29 on Tai is respectfully solicited.

Claim 1 has been amended herein to recite positively that the interpolymeric carrier concentrate is an "interpenetrated crosslinked polymer network" as kindly suggested by the Examiner.

Claims 1, 2, 6-12 and 26-29 also were rejected under 35 U.S.C. 103(a) on Mooney et al. The Examiner has alleged that the composition of Mooney exists as a network, so there is necessarily some entangling and entrapment of the hydrophobic polymer in the crosslinked polymer.

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Applicant respectfully traverses the Examiner's rejection of these claims under '103 on Mooney.

The Mooney reference is seen to be directed to a structured adhesive bandage which includes an occlusive composition. The disclosed occlusive composition in Mooney contained a mixture of an oil or wax solvent base, a network polymer to increase the viscosity of the solvent, and a flow control polymer to assist in controlling the flow characteristics of the wound dressing. The network polymer were commercially available block copolymers of polystyrene and synthetic rubber such as isoprene, or, alternatively crosslinked polyacrylic acid (e.g. Carbopol®), or modified guar gum. The flow control polymer was a polyolefin such as polyethylene, or a stearate or palmitate ester. The occlusive composition was made by blending the several polymer constituents and oil in a batch mixer and coating the mixture onto a substrate present in the adhesive bandage.

Clearly, the Mooney reference did not disclose, or contemplate, as in this invention, a stable, water resistant anhydrous interpolymeric carrier concentrate including a crosslinked network polymer to entrap a distinctly different polymerized monomer within its web. In contrast, the Mooney flow control polymers were merely admixed with the network polymer without being physically entrapped therein upon polymerization in an anhydrous medium, as in this invention.

In summary, the interpenetrated crosslinked polymer network of amended claim 1 defines the network polymer in the invention as a water insoluble, crosslinked polymer of vinyl pyrrolidone and acrylic acid, optionally including an alkyl acrylate, and the entrapped polymer as a C₁-C₃₀ alkyl acrylate, or mixture of such acrylates. These species assure that the second polymer will become entrapped upon polymerization within the network polymer.

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The result is a carrier concentrate which is a stable, water resistant, anhydrous, dense interpenetrated crosslinked polymer network (ICPN). In contrast, the disclosed Mooney polymers, alone or in combination, with Tai do not provide an ICPN as defined in this invention. The pores of the ICPN herein possess a unique ability to accept a high load of an active material, e.g. a sunblock, in a product formulation.

In this invention, the physical incorporation of two or more structurally dissimilar polymers in an intricate web-like structure in an anhydrous condition produces modifications of properties which impart extended stability, increased density and ability to accept other active chemical moieties in the structure of the copolymeric product while shielding them from easy rinse-off removal. Accordingly, the secondary polymer is physically entrapped in the network of the primary crosslinked polymer to produce a highly stable, hydrogen bonded structure.

In view of the foregoing the claims as amended are believed to define patentable invention over the cited art. Reconsideration and early allowance is respectfully solicited.

In the event any issue still remains after this amendment, the Examiner is urged to call Applicant's Attorney, Dr. Walter Katz (973-628-3528) to discuss the matter.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Walter Katz", with a stylized, flowing script.

Dr. Walter Katz
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